



Technical Standard Order

Subject: TSO-C20, COMBUSTION HEATERS

INTRODUCTION

Under section 601 of the Civil Aeronautics Act of 1938, as amended, and Sections 3.06, 3.38132, 4a.07, 4a.40, 4b.05, and 4b.38231 of the Civil Air Regulations issued pursuant thereto, the Administrator of Civil Aeronautics is authorized to adopt standards for combustion heaters intended for use in civil aircraft. In adopting these standards, consideration has been given to existing Government and industry standards for combustion heaters.

DIRECTIVE

Provision. The requirements for combustion heaters, as set forth in SAE Aeronautical Standard AS143B; Heaters, Airplane, Internal Combustion Heat Exchanger Type, dated February 1, 1949,* are hereby established as minimum safety standards for combustion heaters intended for use in civil aircraft.

Application. Combustion heaters complying with the specifications appearing in this Order are hereby approved for all aircraft. Heaters already approved by the Administrator may continue to be installed in aircraft

- (1) for which an application for original type certificate is made prior to the effective date of this Order,
- (2) the prototype of which is flown within one year after the effective date of this Order, and
- (3) the prototype of which is not flown within one year after the effective date of this Order if due to causes beyond the applicant's control.

If an alteration involving a change in type or model of heater is made within nine months after the effective date of this Order, previously approved types of heaters may be installed. However, in any such change made after the nine month period, new types of heaters installed shall meet the specifications contained herein.

SPECIFIC INSTRUCTIONS

Marking. In addition the identification information required in the referenced specification, each heater shall be permanently marked with the Technical Standard Order designation, CAA-TSO-C20, to

identify the heater as meeting the requirements of this Order in accordance with the manufacturers' statement of conformance outlined below. This identification will be accepted by the Civil Aeronautics Administration as evidence that the established minimum safety requirements for combustion heaters have been met.

Data Requirements. Ten copies of the following technical information shall be submitted by manufacturer of the heater with his Statement of Conformance to the Civil Aeronautics Administration, Aircraft Service, Attn: A-298, Washington 25, D.C.

1. Rated combustion air flow rates (or pressure drop) including minimum safe rate and variation with altitude.
2. Rated ventilating air flow rates (or pressure drop) including minimum safe rate and variation with altitude.
3. Ignition characteristics curve established in accordance with Section 6.1.1 of Specification AS143B.
4. Minimum operating voltage used for item 3.
5. Maximum operating altitude.
6. Operating fuel pressure.
7. Installation diagram showing installation of safety devices necessary to achieve compliance with Sections 4.2, 5.7, and 6.5.7 through 6.5.7.2.2.1 of Specification AS143B.
8. Recommended electrical arrangement and any necessary limitations and pressure or temperature settings which are considered essential to proper and safe installation and operation.

Effective Date. After June 15, 1949, specifications contained in this Order will constitute the basis for Civil Aeronautics Administration approval of combustion heaters for use in certificated aircraft.

Deviations. Requests for deviation from, or waiver of, the requirements of this Order, which affect the basic airworthiness of the component, should be submitted for approval by the Chief, Aircraft Service, Office of Aviation Safety, Civil Aeronautics Administration. These requests should be addressed to the nearest Regional Office of the Civil Aeronautics Administration, Attn: Superintendent, Aircraft Branch.

Conformance. The manufacturer shall furnish to the Civil Aeronautics Administration, Aircraft Service, Attn: A-298, Washington 25, D.C., a written statement of conformance signed by a responsible official of his company, setting forth that the heater to be produced by him meets the minimum safety requirements established in this Order. This statement shall indicate whether the heater meets the standards for cabin or wing-empennage heaters as prescribed in SAE Aeronautical Standard AS-143B and whether it has met the standards of this specification pertinent to pressurized systems. Immediately thereafter distribution of the heaters conforming with the terms of this Order may be started and continued.

The prescribed identification on the heater does not relieve the aircraft manufacturer or owner of responsibility for the proper application of the heater in his aircraft, nor waive any of the requirements concerning type certification of the aircraft in accordance with existing Civil Air Regulations.

If complaints of nonconformance with the requirements of this Order are brought to the attention of the Civil Aeronautics Administration, and investigation indicates that such complaints are justified, the Administrator will take appropriate action to restrict the use of the product involved.

Copies of this Technical Standard Order and other Technical Standard Orders may be obtained from the Civil Aeronautics Administration, Aviation Information Staff, Washington 25, D.C.

* Copies may be obtained from the Society of Automotive engineers, 29 W. 39th St., New York, N.Y.

/S/ D. W. Rentzel
Administrator of Civil Aeronautics